A scientific study¹, conducted at the Leeds Dental Institute, has shown there to be no significant difference in the enamel demineralising effects of intrinsic sugars (those contained within foods) and ‘free’ or extrinsic sugars (those added in food manufacturing and found in fruit juice and honey).

The study, by A I Issa, K J Toumba, A J Preston, M S Duggal, was performed using an Intra-oral Cariogenicity Test - a device placed in the mouth to test how conducive substances are to promoting dental caries - to compare the effect on enamel demineralisation of fruits and vegetables, consumed either whole or in a juiced form.

The findings contradict a long-held belief in the UK that intrinsic sugars contained in whole fruits, for example, are ‘safer for teeth’ than extrinsic sugars found in fruit juices.

Earlier reports from both the Committee on Medical Aspects of Foods Policy (COMA) 1991², and the World Health Organisation (WHO) 2004³, have recommended limiting the consumption of extrinsic sugars in favour of intrinsic sugars, which were seen to present less of a risk to dental health. However, in 2007 a joint report from the Food and Agriculture Organisation (FAO) and WHO⁴, provided a scientific update on carbohydrates in human nutrition and referred to ‘total sugars’ as the most useful term when describing dietary sugars, suggesting a change in direction from previous thinking.

The study was conducted among ten healthy adults, who had normal salivary function. Each subject wore a removable appliance attached to the teeth of their lower jaw, which carried pre-demineralised human enamel slabs. They each consumed one of the test foods, seven times each day, for ten days. They were instructed to brush their teeth twice a day, using fluoride-free toothpaste, while the appliances were out of the mouth.

Test foods were whole or juiced apples, oranges, grapes, carrots, and tomatoes – juices were extracted from the same batch of fresh produce consumed as whole fruits. Raisins were also included in the study. The study showed significant net demineralisation when the subjects consumed each of the test foods, containing either extrinsic or intrinsic sugars: tomato, tomato juice, apple, apple juice, orange, orange juice, carrot, carrot juice, grape, grape juice, and raisins.

Professor Monty Duggal, co-author of the study, said: “The results of the research show that eating fruits and vegetables as ‘whole’ foodstuffs may cause similar demineralisation in enamel to when they are consumed as a juice, when frequently consumed by people who are not using fluoride toothpaste”.

“The results will be extremely useful in helping to provide evidence for accurate health advice for patients. The findings are particularly significant for ‘at risk’ patients, usually those not brushing regularly with fluoride toothpaste, and especially children who can be less than diligent in this regard.”

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